Claims Incorporating Amendments

1. An aircraft deicer panel comprising an inner support layer which is electrically insulating, an outer cover layer which is thermally conducting, a heater layer which is electrically insulating, and an electrical heating element attached to the heater layer;

wherein the electrical heating element comprises an electrically conductive strand stitched in the heater layer in a heat-dissipating pattern;

wherein the stitched heater layer is joined to the inner support [surface] layer and the outer cover layer; and

wherein the inner support layer has a bondside surface adapted to be secured an ice-susceptible surface of an aircraft.

2. A deicer panel as set forth in claim 1, wherein the heat-dissipating pattern comprises a winding path of closely spaced and sharply curved turns formed from a continuous length of the electrically conductive strand.

3. A deicer panel as set forth in claim 1, wherein the heater layer is made from cured rubber, fiberglass, or composite adhesive.

4. A deicer panel as set forth in claim 1, wherein the electrically conductive strand is made of aluminum bronze alloy, nickel-chromium alloy, nickel-chromium-iron alloy, or nickel-copper alloy.

5. A deicer panel as set forth in claim 1, wherein the electrical heating element further comprises a dielectric strand which is used to secure the electrically conductive strand in the heat-dissipating pattern.

6. A deicer panel as set forth in claim 1, wherein the electrically conductive strand forms a series of linear stitches on a breezeside of the heater layer.

7. A deicer panel as set forth in claim 6, wherein the electrical heating element further comprises a dielectric strand forming a series of linear stitches on a bondside of the heater layer.

8. A deicer panel as set forth in claim 7, wherein the electrically conductive strand and the dielectric strand interlock between adjacent stitches.

9. A deicer panel as set forth in claim 1, further comprising a thermal conducting layer which is electrically insulating and which is positioned between the heater layer and the outer cover layer.

10. In combination, an aircraft and a deicer panel as set forth in claim 1, the bondside surface of the inner support layer being cemented to the ice-susceptible surface of the aircraft.

11. A combination as set forth in claim 10, wherein the ice-susceptible surface is on a wing of the aircraft.

12. In combination, an aircraft and a deicer panel as set forth in claim 1 secured to each wing of the aircraft, the bondside surface of the inner support layer of each deicer pane being cemented to the respective wing.

13. A method of making the aircraft deicer panel of claim 1, said method comprising the steps of:

stitching the electrically conductive strand into the heater layer in the heating-dissipating pattern;

joining the heater layer to the inner support layer and the outer cover layer; and

securing a bondside surface of the inner support layer to a surface of an aircraft.

14. A method as set forth in claim 13, wherein said stitching step is performed by a sewing machine.

15. A method as set forth in claim 14, wherein said stitching step comprises programming the sewing machine to automatically stitch the heat dissipating pattern.

16. A method of making an aircraft deicer panel, comprising the steps of:

providing an inner support layer which is electrically insulating, an outer cover layer which is thermally conducting, and a heater layer which is electrically insulating;

stitching an electrically conductive strand in the heater layer in a heat-dissipating pattern;

joining the inner support layer, the heater layer, and the cover layer together; and

securing a bondside surface of the inner support layer to a surface of an aircraft.

17. A method as set forth in claim 16, further comprising the step of positioning a thermal conducting layer which is electrically insulating between the heater layer and the outer cover layer.

18. A method as set forth in claim 17, wherein said stitching step comprises stitching a winding path of closely spaced and sharply curved turns from a continuous length of the electrically conductive strand to form the heat-dissipating pattern.

19. A method as set forth in claim 18, wherein said stitching step comprises using a dielectric strand to secure the electrically conductive strand in the heat-dissipating pattern.

20. A method as set forth in claim 19, wherein said stitching step comprises forming a series of linear stitches on a breezeside of the heater layer with the electrically conductive strand.

21. A method as set forth in claim 20, wherein said stitching step comprises forming a series of linear stitches on a bondside of the heater layer with a dielectric strand.

22. A method as set forth in claim 21, wherein said stitching step comprises interlocking the electrically conductive strand with the dielectric strand to separate adjacent stitches.

23. A method as set forth in claim 16, wherein said stitching step comprises programming a sewing machine to automatically stitch the heat dissipating pattern.

24. A deicer panel as set forth in claim 1, wherein the inner support layer comprises a rubber-coated fabric.

25. A deicer panel as set forth in claim 24, wherein the outer cover layer is made from a material selected from a group consisting of sheet aluminum alloy, stainless steel and magnesium alloy.

26. A deicer panel set forth in claim 1, further comprising a thermal conducting layer positioned between the heater layer and the outer cover layer.

27. A deicer pane as set forth in claim 26, wherein the thermal conducting layer comprises a rubber-coated fiberglass fabric.

28. A deicer panel as set forth in claim 1, wherein the outer cover layer is made from a material selected from a group consisting of sheet aluminum alloy, stainless steel and magnesium alloy.

29. A method as set forth in claim 13, wherein said securing step comprises securing the bondside surface of the inner support layer to a wing of the aircraft.

30. A method as set forth in claim 13, wherein said securing step comprises cementing the bondside surface of the inner support layer to the surface of the aircraft.

31. A method as set forth in claim 16, wherein said securing step comprises securing the bondside surface of the inner support layer to a wing of the aircraft.

32. A method as set forth in claim 16, wherein said securing step comprises cementing the bondside surface of the inner support layer to the surface of the aircraft.

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